thickness was analyzed as compared with baseline. For example, in one subject, treatment increased hair count, terminal hair and follicle thickness, at 12 weeks, 22.4%, 27.8% and 23.9% respectively as compared to baseline. In another subject, treatment increased hair count, terminal hair and follicle thickness, at 12 weeks, 23.7%, 24.2% and 22.2% respectively as compared to baseline. In subject 009 (having baseline hair count 179, 12 weeks hair count 193, 5 month hair count 201, as above) treatment increased hair count, terminal hair and follicle thickness, at 12 weeks, 7.8%, 48.5% and 19.2% respectively; and, at 20 weeks, 12.9%, 33.0% and 21.1% respectively, as compared to baseline. In subject 013 (having baseline hair count 266.5, 12 weeks hair count 267, 5 month hair count 294, as above) treatment increased hair count, terminal hair and follicle thickness, at 12 weeks, 0.2%, 25.0% and 8.3% respectively; and, at 20 weeks, 10.3%, 41.4% and 23.0% respectively as compared to baseline. In subject 024 (baseline hair count 335.5, 12 weeks hair count 415, 5 month hair count 433 as above) treatment increased hair count, terminal hair and follicle thickness, at 12 weeks, 23.7%, 24.2% and 22.2% respectively; and, at 20 weeks, 29.1%, 5.9% and 17.3% respectively as compared to baseline respectively.

[0183] Of note, treated study members showed a significant increase in the number of terminal hairs and increase in thickness density at 3 months (84.6% of pts). Additionally, no adverse reactions observed, normal histology was observed and no hamartomas were observed.

[0184] The results point to use of hECM in additional applications, such as to prevent hair loss in patients post transplant and for eyebrow and eyelash growth. In hair transplant patients, hair is known to fall out and generally take 4 to 5 months to return, thus, treatment with hECM would prevent hair loss in such individuals post transplant.

Example 8

Generation of Human Extracellular Matrix Compositions (hECM)

[0185] Human ECM composition was generated using newborn human fibroblasts. Fibroblasts were seeded onto beadlike structures conditioned with liquid media. Culture conditions were optimized without the need for fetal bovine serum. Within a few days, under embryonic culture conditions described herein, cells produced a dense embryonic-like ECM. Secretion of Wnt family proteins, as well as several growth factors was observed.

[0186] Cultures were grown to confluency. The cultures were subsequently exposed to sterile water to induce uniform lysing of the cells. The acellular hECM was then washed to ensure removal of all living cells and cellular debris and examined microscopically to confirm removal of cellular debris. Next, human fibroblasts were exposed to culture flasks coated with the hECM or plated onto a non-treated flask and then covered with a thick layer of matrix. The ECM proteins identified in the hECM are shown in Table 7.

TABLE 7

Extracellular Matrix Proteins Observed in Hecm

Matrix Protein	Function
Versican	structural, binds hyaluronic acid (HA) and collagen
Decorin	binds growth factors, influences collagen structure
Betaglycan	TGF-β Type III receptor
Syndecan	binds growth factors, enhances activity
Collagen Type I, II, III, V	major structural proteins of dermis
Fibronectin	cell adhesion, spreading, migration, motogenesis
Tenascin	induced in wound healing, control of cell adhesion

[0187] The hECM was observed to induce an increase of metabolic activity of the cells, as measured by increased enzymatic activity using the MTT assay. Human ECM, unlike mouse ECM, induced a dose-dependant increase in cellular metabolic activity as measured by MTT assay. Cells were observed to rapidly and uniformly infiltrate the hECM overlay material. In addition, there was a dose-dependant increase in cell number in response to hECM, as measured by the Pico Green assay.

[0188] Known coatings, injectables, and implantable matrix products are typically either bovine collagens, porcine matrix proteins derived from the intestines or urinary bladder, hyaluronic acid, or human ECM derived from cadaver skin. While these products may offer benefits by creating a more physiologically equivalent environment, none are completely human and contain the entire range of matrix proteins found in young, developing tissue. The hECM produced contains the same ECM materials found in young, healthy tissue. It also was observed to support the active proliferation of human cells as well as rapid in-growth of cells. There are several advantages evident in using hECM in applications involving a human subject. For example, hECM promotes rapid host cell integration and improved healing (acts as normal scaffold for host cells and subsequent remodeling). Additionally, hECM eliminates the concern regarding viral transmission from non-human animal and human tissues (particularly BSE from bovine tissue and TSE from human tissue). Further, consistent product composition and performance is observed for hECM as compared to biologic products, particularly human dermis and fascia lata. Additionally, hECM reduces erosion of host tissues as compared to synthetic implants.

Example 9

Human Fibroblast Derived Hypoxic Conditioned Extracellular Matrix for Medical Aesthetic Applications

[0189] A double blind, randomized study of topical hECM administration post facial ablative laser surgery was conducted. The study enrolled 41 subjects between the ages of 40 and 60 years of age. All members of the study group were without prior invasive or minimally invasive surgery, or topical anti-aging treatments within the prior 12 months. The laser procedure included full fractional ablative laser procedure, pen-ocular, peri-oral and full face. A Palomar Starluz 550p laser was used (1540-non-ablative and 2940 ablative). Subjects were administered topical hECM compositions once a day (at different concentrations) or placebo vehicle for 14 days. End points of the study included clinical photography (3 blinded evaluations—dermatologists), transepidermal water loss (TEWL), punch biopsy, and evaluation of erythema, edema, and crusting.